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PURPOSE: A base station channel card unit of a WLL is provided to reduce a cost of a modem by simplifying a structure of the modem by installing an FIR(Finite Impulse Response) filter in an IF (Intermediate Frequency) card, and improve a performance of a forward data link structure of the channel card unit by implementing a digital interface between the channel card and the IF card.

CONSTITUTION: A plurality of modems(110-1-n) receive a channel IF signal inputted through an RF unit and CDMA-demodulate it by I and Q channels. An I channel adder(120-1) and a Q channel adder (120-2) respectively digital-add the 1 bit serial data of I channel and Q channel outputted from the first through the nth modems(110-1-n). An I channel adder(210-1) and a Q channel adder(120-2) respectively add the plurality of 1 bit digital data of I channel and Q channel outputted from the I channel adder(120-1) and the Q channel adder(12-0-2) of a plurality of channel cards(100). An I channel FIR filter(220-1) and a Q channel FIR filter(220-2) respectively perform a baseband filtering to output the I and Q channel digital data outputted from the I channel adder(210-1) and the Q channel adder(210-2) for a finite time. An I channel DAC(203-1) and a Q channel DAC(230-2) respectively convert the digital data of the I channel and the Q channel that have passed the I channel FIR filter(220-1) and the Q channel IFR filter(220-2) into analog signals. An I channel modulator(240-1) and a Q channel modulator(240-2) respectively modulate the analog signals of I and Q channels outputted from the I channel DAC(230-1) and the Q channel DAC(230-2) into baseband analog signals. An adder(250) adds the I channel baseband analog signal and the Q channel baseband analog signal outputted from the I channel modulator(240-1) and the Q channel modulator(240-2) and outputs them to an ASCU(Analog Common and Sector interface Unit).

Fig. 2

7 200: IF card 220- 1: the finite impulse response filter for I channel.

8 220- 2: the finite impulse response filter 230- for Q-channel 1: DAC for I channel.

9 230- 2: the DAC 240- for Q-channel 1: the modulator for I channel.

10 240- 2: the modulator for Q-channel 250: adder.

11 The present invention relates to the channel card apparatus (Channel Card Unit) for the base station o wireless local loop (it calls less than Wireless Local Loop : because of being 'WLL') system, particula the channel card apparatus for the base station of the WLL system which improves the performance o forward data link structure of the channel card apparatus by including the finite impulse response (it c less than Finite Impulse Response : because of being 'FIR') filter which is built in modem within the c card in the IF card.

12 Generally, in the WLL system of the wide band-code division multiple access (Wideband Code Divis Multiple Access) mode is the telephone central office, it is the system which comprises link by instea using the wireless system with the wire line to the subscriber terminal. Because of having the advanta

14   In the channel card apparatus is the base station, it is the module supporting the CDMA interface with subscriber matching device. It inputs the intermediate frequency signal for the channel which as show

Fig. 1, is inputted through the RF apparatus (non illustration) and the conventional channel card appa according to the forward data link structure is comprised of the IF card (20) consisting of channel car the adder (21-2) for the respective adder (21-1) for I channel added and Q-channel the analog signal o DAC (13-1) for I channel within a plurality of channel cards (10) and an plurality of I outputted in the (13-2) for Q-channel and Q-channel, the modulator (22-2) for the modulator (22-1) for the adder (21- channel and I outputted in the adder (21-2) for Q-channel and I channel and Q-channel the analog sig Q-channel is modulated into the respective base band analog signal, and the modulator (22-1) for I ch and the adder (23) consisting of I channel and a plurality of 1~ the n modems (11-1~n) demodulated according to Q-channel with CDMA, the adder (12-2) for the adder (Adder) (12-1) for I channel and t channel adding I of N bit, and the DAC (13-2) for the DAC (Digital Analog Converter) (13-1) for I cl and the Q-channel converting digital data of I of the adder (12-1) for I channel and N bit outputted in adder (12-2) for Q-channel and Q-channel into the respective analog signal. The adder (12-2) for the a (Adder) (12-1) for I channel and the Q-channel adding I of N bit is demodulated in the 1~ the n mode ~n) as CDMA and is outputted and data of Q-channel with respective digital. As to the modulator (22 I channel and the adder (23), the modulator (22-2) for Q-channel adds the base band analog signal of respective outputted I channel and base band analog signal of Q-channel and outputted to the ASCU (illustration).

15   In the conventional channel card apparatus constructed as described above, a plurality of 1~ the n mo (11-1~n) performs channel coding within the channel card (10). The CDMA demodulation process is performed to the symbol post repetition, the walsh coding, the PN coding, baseband filtering process. digital data of 32.768MHz passing through the baseband filter, which at this time, is built in each mo that is, the finite impulse response filter is outputted.

16   But as described above, there is a problem that the finite impulse response filter the conventional chai card apparatus is certainly built in each modem used as the channel element and the logic burden of tl impulse response filter about modem is not a few, the modem cost is expensive.

17   That is, for example, it need the modem of 60 in case the channel element of 60 channel exists in one station. It becomes the specific gravity which at this time, finite impulse response filter (it need the fii impulse response filter of 120 totals to I channel, and the Q-channel respective 60) occupy in modem 20%.

18   And there is a problem that the digital data processing passing through the finite impulse response fili each modem is not easy and the error generation probability is high. In addition, it is necessary to hav many signal wire and DAC is included and to directly output digital data passing through the finite in response filter to the IF card the analog interface has to be implemented between the channel card and card. Signal and characteristic deterioration are many according to the implementation of the analog i as well as the overall structure of the channel card becomes complicated.

24   That is, as the finite impulse response filter (220-2) for the finite impulse response filter (220-1) for I and Q-channel are equipped in the IF card (200), the logic number of the 1~ the n modem (110-1~n) i decreased within a plurality of channel cards (100) and the design of the effective modem becomes pc in structure and cost side. And the adder (120-2) for the adder (12O-1) for I channel and Q-channel ac digital data of 8.192MHz outputted within a plurality of channel cards (100) in the 1~ the n modem (1 ~n) and the implementation of the digital interface is possible through the IF card (200) through the li the line for I channel and Q-channel as the direct output box.

25   It is the same as that of the next time if the operation of the channel card apparatus for the base statior WLL system by the present invention constructed as described above is illustrated.

26   Firstly, it inputs the intermediate frequency signal for the channel inputted through the RF apparatus ε demodulates according to I channel and Q-channel with CDMA and the 1~ the n modem (110-1~n) o serial data spreading with the PN code of 8.192Mbps within the channel card (100).

27   Subsequently, it adds the serial data, spreading with the PN code of 8.192Mbps outputted within a plu of channel cards (100) in which the finite impulse response filter is not built in the 1~ the n modem (1 ~n) that is, I of the single bit and serial data of Q-channel with respective digital and the adder (120-2 the adder (12O-1) for I channel and Q-channel output to the IF card (200).

28   And then, it adds digital data of the adder (12O-1) for I channel and an plurality of single bit Is output the adder (120-2) for Q-channel and Q-channel within a plurality of channel cards (100) and the addei 2) for the adder (210-1) for I channel and Q-channel output within the IF card (200) to the finite impu response filter (220-2) for the finite impulse response filter (220-1) for I channel and Q-channel.

29   Subsequently, the finite impulse response filter (220-2) for the finite impulse response filter (220-1) f channel and Q-channel perform the baseband filtering outputted digital data of the adder (210-1) for I channel and I outputted in the adder (210-2) for Q-channel and Q-channel for the limited time.

30   It converts digital data of the finite impulse response filter (220-1) for I channel and I passing through finite impulse response filter (220-2) for Q-channel and Q-channel into the respective analog signal ai , and the DAC (230-2) for the DAC (230-1) for I channel and Q-channel output to the modulator (24C the modulator (240-1) for I channel and Q-channel. The modulator (240-2) for the modulator (240-1) I channel and Q-channel modulate the analog signal of the DAC (230-1) for I channel and I outputted DAC (230-2) for Q-channel and Q-channel into the respective base band analog signal.

31   Finally, in the adder (250) is the modulator (240-2) for the modulator (240-1) for I channel and Q-cha the base band analog signal of the respective outputted I channel and base band analog signal of Q-ch are added and it outputs to ACSU.

36   Therefore, in the present invention, by using modem and the finite impulse response filter doing not h with characteristic deterioration as the digital data processing of the forward link, modem is impleme terms of the low price and the structure of characteristic being moreover excellent is implemented.

Claim[1] :

37   The channel card apparatus for the base station of the WLL system wherein the intermediate frequenc signal for the channel inputted through the RF apparatus is inputted and it is comprised of the IF card consisting of the channel card, the adder for the respective adder for I channel added and Q-channel d data of the adder for I channel within a plurality of channel cards and an plurality of single bit Is outpi the adder for Q-channel and Q-channel, the finite impulse response filter for the finite impulse respon for the adder for I channel and I outputted in the adder for Q-channel and I channel and the Q-channel performing the baseband filtering outputted digital data of Q-channel for the limited time, DAC for D I channel and the Q-channel converting digital data of the finite impulse response filter for I channel ε passing through the finite impulse response filter for Q-channel and Q-channel into the respective ana signal, the modulator for the modulator for DAC for I channel and I outputted in DAC for Q-channel channel and Q-channel the analog signal of Q-channel is modulated into the respective base band ana signal, and the modulator for I channel and the adder consisting of I channel and a plurality of 1~ the modems demodulated according to Q-channel with CDMA, and the adder for the adder for I channel Q-channel adding I, and the adder for the adder for I channel and the Q-channel adding I is demodulai the 1~ the n modem as CDMA and is outputted of the single bit and serial data of Q-channel with resj digital. As to the modulator for I channel and the adder, the modulator for Q-channel adds the base ba analog signal of the respective outputted I channel and base band analog signal of Q-channel and outp to ACSU.

11-n 제n 모뎀
11-3 제3 모뎀
11-2 제2 모뎀
11-1 제1 모뎀

디지털신호 N

Q 채널용 에더 12-2
I 채널용 에더 12-1

디지털신호 N

Q 채널용 DAC 13-2
I 채널용 DAC 13-1

아날로그 신호 1

채널카드 10

21-2
21-1

Q 채널용 변조기 22-2
I 채널용 변조기 22-1

23

IF카드 20